

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

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Free-Standing Mathematics Qualification  
 January 2006  
 Intermediate Level



**HANDLING AND INTERPRETING DATA**  
**Unit 6**

**6986/2**

Friday 3 February 2006 9.00 am to 10.15 am

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| <p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>• a calculator</li> <li>• a clean copy of the Data Sheet (enclosed)</li> <li>• a protractor</li> <li>• a ruler</li> </ul> |
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Time allowed: 1 hour 15 minutes

**Instructions**

- Use blue or black ink or ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want marked.
- You may **not** refer to the copy of the Data Sheet that was available prior to this examination. A clean copy is enclosed for your use.

**Information**

- The maximum mark for this paper is 50.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.

**Advice**

- In all calculations, show clearly how you work out your answer.

For Examiner's Use			
Number	Mark	Number	Mark
1		9	
2			
3			
4			
5			
6			
7			
8			
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			

**SECTION A**

Answer **all** questions in the spaces provided.

*Use Sales by large retailers on page 2 of the Data Sheet.*

**1** The data are reproduced below.

	A	B	C	D
1	<b>Retailer</b>	<b>Sales (in billions of pounds)</b>	<b>Number of head-office staff</b>	<b>Sales per head-office employee (in millions of pounds)</b>
2	Asda	13.4	1000	
3	Morrisons	4.3	425	
4	Safeway	8.8	1800	
5	Sainsbury's	17.4	4000	
6	Tesco	26.1	5000	
7	Marks and Spencer	8.1	3000	

Source: Information provided by supermarkets

- (a) Complete the spreadsheet, giving the average sales per head-office employee to the nearest million pounds. (4 marks)

Space for working

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- (b) Write down a formula which gives the value in cell D6.

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Answer .....

(1 mark)

(c) Make one comment about these retailers based upon your calculated results in the spreadsheet.

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*(1 mark)*

<b>6</b>

**Turn over for the next question**

**SECTION B**

Answer **all** questions in the spaces provided.

Use **Times waiting for a sale** on page 2 of the Data Sheet.

2 The data are reproduced below.

Waiting time ( $w$ minutes)	Frequency	Mid-interval	
$0 \leq w < 40$	25		
$40 \leq w < 80$	106		
$80 \leq w < 120$	85		
$120 \leq w < 160$	34		
$160 \leq w < 200$	21		
$200 \leq w < 240$	9		
Total	280		

(a) Write down the modal class of these waiting times.

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Answer .....

(1 mark)

(b) Calculate an estimate of the mean waiting time.

You may use the blank columns in the table above to help you calculate necessary values.

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Answer .....

(5 marks)

- 3 (a) Using the data given, state the probability that a person in the queue when the shop opened had waited at least two hours.  
Give your answer in its lowest terms.

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Answer .....  
(2 marks)

- (b) Beth arrived at 6 am at the shop for its sale which started at 8 am.

Estimate the proportion of those in the queue in front of Beth who had already been queuing for over 40 minutes.

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Answer .....  
(2 marks)

4

**Turn over for the next question**

**SECTION C**

Answer **all** questions in the spaces provided.

Use **Queen Mary 2** on page 3 of the Data Sheet.

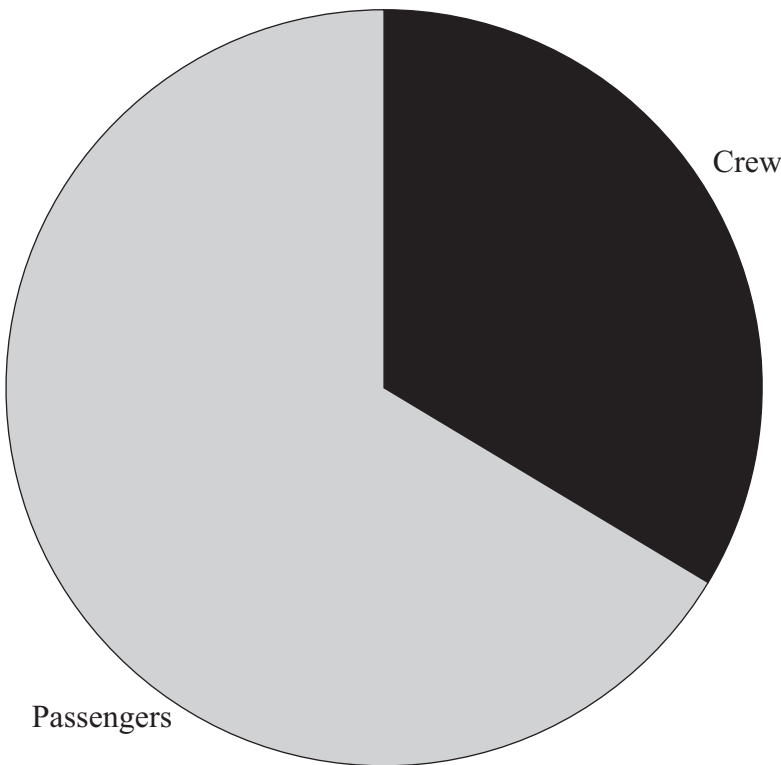
4 (a) Calculate the number of crew on the Queen Mary 2.

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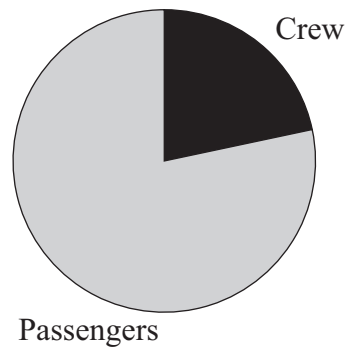
Answer .....  
(3 marks)

The comparative pie charts below show the numbers of people who were on the Queen Mary 2 and on a smaller cruise ship.

**Queen Mary 2**



**Cruise ship**



(b) Calculate the total number of people who were on the smaller cruise ship.

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Answer .....  
(4 marks)

(c) Calculate the number of crew on the smaller cruise ship.

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Answer .....  
(2 marks)

<b>9</b>

**Turn over for the next question**

**SECTION D**

Answer **all** questions in the spaces provided.

Use **Ranking of cars** on page 4 of the Data Sheet.

5 Jeremy gives one car the following scores:

- 78 economy
- 92 performance
- 81 comfort
- 85 reliability.

He weights these scores in the ratio 4 : 1 : 3 : 2.

Calculate the overall weighted score which Jeremy gives the car.

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Answer .....  
(3 marks)

<b>3</b>



**Turn over for the next question**

**SECTION E**

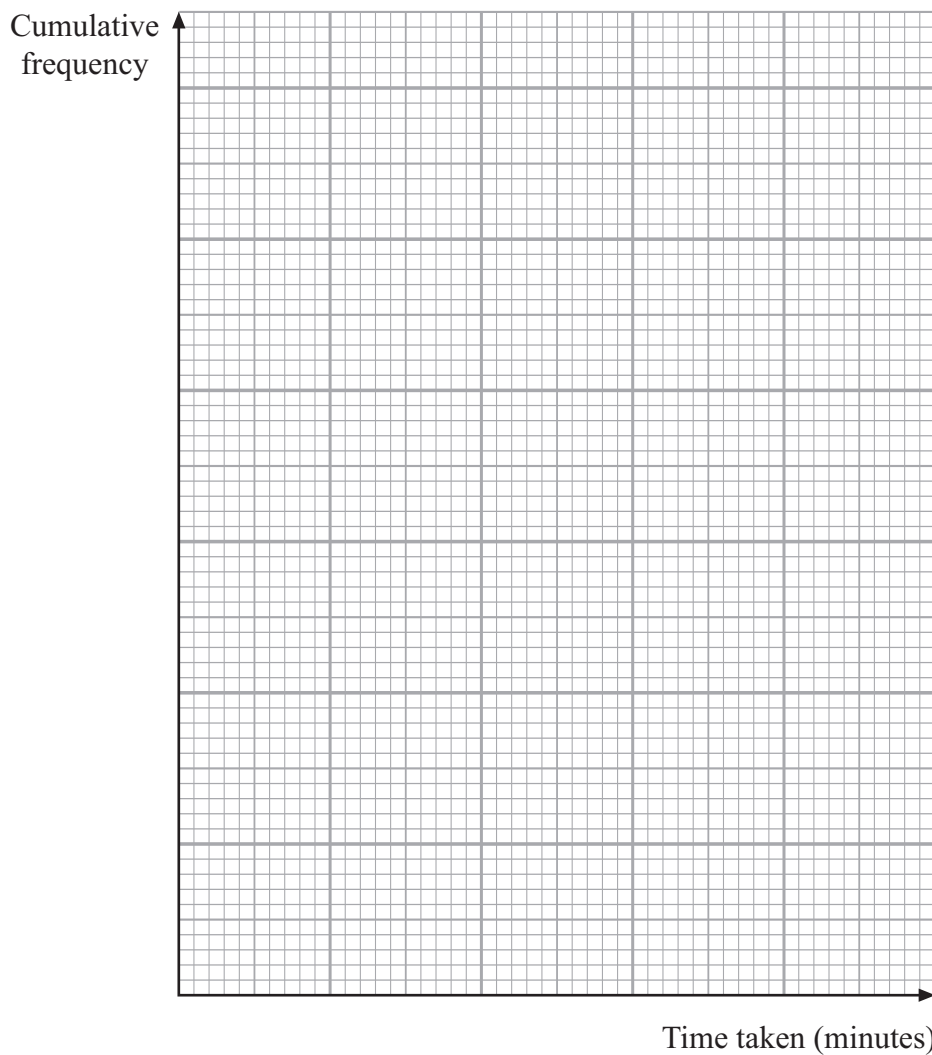
Answer **all** questions in the spaces provided.

Use **Driving test** on page 4 of the Data Sheet.

- 6 (a) The data are reproduced below.

Time taken ( $t$ minutes)	Number of tests	
$0 < t \leq 30$	0	
$30 < t \leq 40$	1	
$40 < t \leq 50$	24	
$50 < t \leq 60$	72	
$60 < t \leq 70$	19	
$70 < t \leq 80$	3	
$80 < t \leq 90$	1	

Draw a cumulative frequency curve to show the data.



(4 marks)

(b) Use your cumulative frequency curve to find:

(i) the median;

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Answer .....  
(2 marks)

(ii) the lower quartile;

Answer .....  
(1 mark)

(iii) the upper quartile;

Answer .....  
(1 mark)

(iv) the interquartile range.

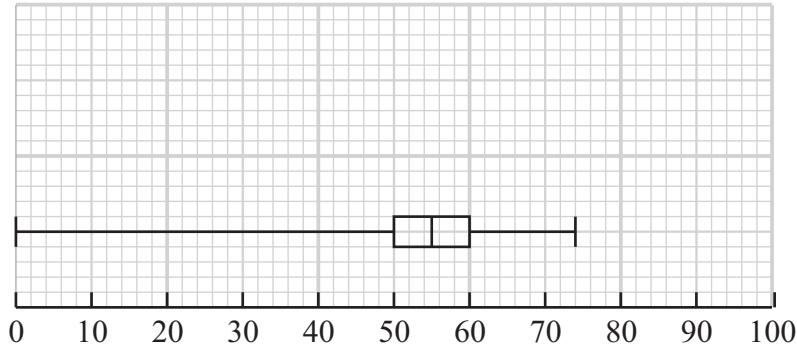
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Answer .....  
(1 mark)

**Question 6 continues on the next page**

- (c) On one Saturday, the length of time taken by candidates was also recorded. The data for this Saturday are shown as a box and whisker diagram below.

Add to the graph below, as another box and whisker diagram, the data you have found for Wednesday.



(3 marks)

- (d) Use the box and whisker diagrams to compare the lengths of time taken to complete the tests on Wednesday and Saturday.

Comparison 1.....

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Comparison 2.....

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(3 marks)

15

- 7 On Saturday there were 80 candidates.  
Of these 80 candidates, three-fifths passed.

How many candidates passed?

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Answer .....

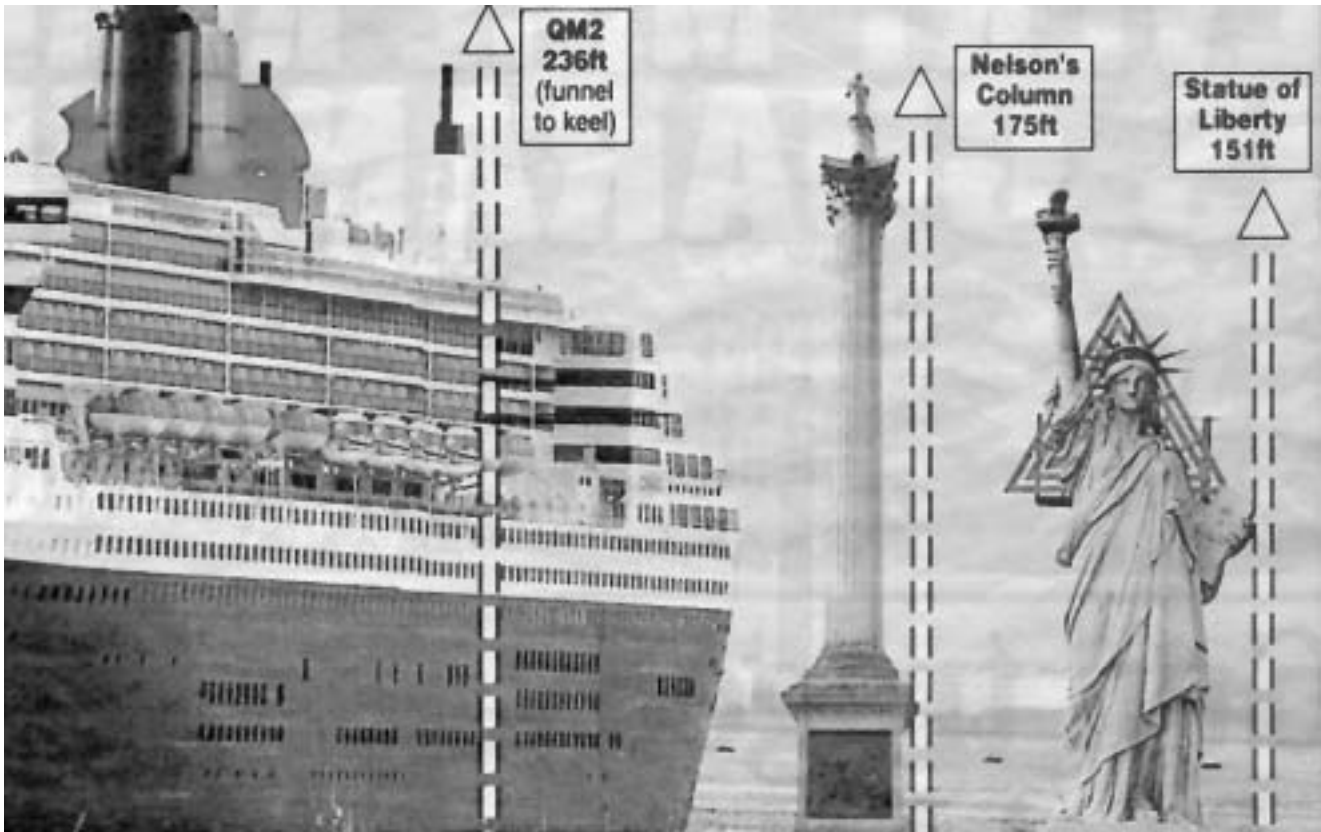
(2 marks)

2

**SECTION F**

Answer **all** questions in the spaces provided.

- 8 The diagram below shows how the height of the Queen Mary 2 compares with two buildings. Identify one way in which this diagram is misleading.



Source: *Daily Mail*, 9 January 2004

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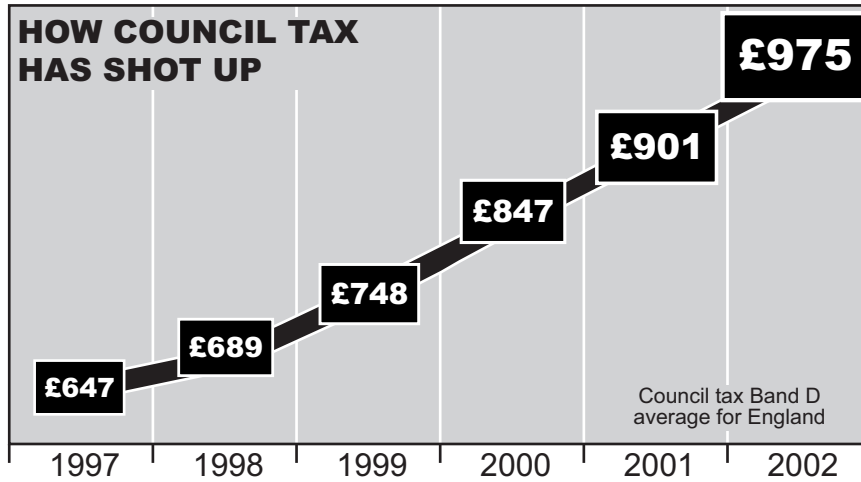
(2 marks)

2
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**Turn over for the next question**

9 The graph shows the annual increase in council tax over the years 1997 – 2002.

Write down **two** criticisms of the graph.



Source: *Daily Mirror*, 22 September 03

Criticism 1:

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Criticism 2:

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(3 marks)

3
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**END OF QUESTIONS**

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